REMARKS

This is in response to the following rejections of claims 1-8:

(a) Claims 3, 4, 5, 6, 7 and 8 were rejected under 35 U.S.C. § 103 as being unpatentable over Takakuwa considered with Okabe et al. and numerous secondary references and the Blanchard Declaration.

(b) Claims 1 and 2 were rejected under 35 U.S.C. § 103 as being unpatentable over Takakuwa considered with Okabe et al. and numerous other secondary references and over the Lidow et al. '286 patent considered with numerous secondary references.

(c) Claims 3 to 8 were rejected under 35 U.S.C. § 103 as being unpatentable over Hendrickson considered with secondary references; and as being unpatentable over the Lidow et al. '286 patent considered with numerous secondary references.

Reconsideration of all rejection and confirmation of claims 1-8 is respectfully requested. A favorable consideration of new claims 9 to 20 is also requested.

For the Examiner's convenience, the following is a Table of Contents of the points of argument made hereinafter:

TABLE OF CONTENTS

I. INTRODUCTION

U.S. Patent No. 5,130,767 (the "'767 patent"), the subject of this reexamination proceeding, is a continuation of U.S. Patent No. 5,008,725 (the "'725 patent"). The '767 and '725 patents will expire concurrently based on Patent Owner's terminal disclaimer in the '767 patent. The independent claims of the '767 and '725 patents are virtually identical, with the exception of the last paragraph of each of the independent claims of the '767 patent, which recite:

> "a gate pad electrode section on the surface of said device and at least one finger extending from said gate pad; said at least one finger electrically contacting said polysilicon gate electrode at a plurality of spaced locations over the surface of said polysilicon gate electrode, thereby to reduce the R-C delay constant of said device."

Except with respect to the above-quoted language, the rejections set forth in the Office Action mailed on April 27, 1995 in connection with the present reexamination are analogous in many instances to the rejections set forth in the Office Action mailed on January 25, 1995 in the pending reexamination of the '725 patent, Reexamination Control No. 90/003,495. Patent Owner responded to that Office Action in the '725 reexamination by way of an Amendment filed on March 24, 1995, and the Examiner vacated many of the rejections in a subsequent Office Action mailed May 17, 1995.

For purposes of brevity and consistency, Patent Owner hereby incorporates herein by reference the Office Action mailed January 25, 1995 (Exhibit A hereto), the Amendment filed on March 24, 1995 (Exhibit B hereto) and the Office Action mailed May 17, 1995 (Exhibit C hereto) in Reexamination Control No. 90/003,495. The applicability of the arguments and responses contained these documents to the present rejections of the claims of the '767 patent is explained below.

Accordingly, for the reasons discussed below, Patent Owner submits that the rejection of claims 1-8 should be withdrawn and that the patentability of those claims, and proposed new claims 9-28, should be confirmed.

II. CORRESPONDENCE OF THE PROPOSED NEW '767 CLAIMS TO THE PROPOSED CLAIMS PENDING IN THE '725 REEXAMINATION

Some of the claims subject to the Examiner's '725 Office Action mailed May 17, 1995 have since been renumbered in a Non-Responsive Amendment filed May 25, 1995 (Exhibit D hereto).

New '767 proposed independent claims 11, 13, 15 and 18 correspond (with the exception of the last paragraph in each of the foregoing claims) to proposed independent claims 15, 17, 21 and 24 subject to reexamination in the co-pending reexamination of the '725 patent.

New '767 proposed dependent claims 12, 14, 16 and 19 correspond to proposed dependent claims 19, 20, 23 and 26 subject to examination in the co-pending reexamination of the '725 patent.

New '767 proposed dependent claims 9, 10, 17 and 20 correspond to proposed dependent claims 16, 18, 22 and 25 in the co-pending reexamination of the '725 patent.

III. THE REJECTIONS OF CLAIMS 1-8 SHOULD BE WITHDRAWN.

A. *"Claims 3, 4, 5, 6, 7 and 8 are rejected under 35 U.S.C 103 as being unpatentable over Takakuwa, considered with Okabe et al. . . . ."* **Office Action, p. 2.**

Patent Owner responded to an analogous rejection in '725 Reexamination Control No. 90/003,495. ('725 Office Action mailed 1/25/95 [Ex. A hereto], pp. 2-9; '725 Amendment filed 3/24/95 [Ex. B hereto], pp. 14-23.) For the same reasons that the rejections over Takakuwa were withdrawn in the '725 reexamination ('725 Office Action mailed 5/17/95 [Ex. C hereto], pp. 4-8), Patent Owner respectfully submits that the rejection of claims 3, 4, 5, 6, 7 and 8 of the '767 patent under 35 U.S.C 103 as being unpatentable over Takakuwa (as a primary reference) should also be withdrawn.

B. ***"Claims 1 and 2 are rejected under 35 U.S.C. 103 as being unpatentable over Takakuwa, Okabe et al. '878 . . . further considered with Fukuta"*** **Office Action, p. 10.**

Patent Owner responded to an analogous rejection in the '725 reexamination. ('725 Office Action 1/25/95 [Ex. A hereto], pp. 9-10; '725 Amendment filed 3/24/95 [Ex. B hereto], p. 23.) In the Office Action mailed on May 17, 1995 in the '725 reexamination, in the paragraph bridging pages 16-17 (see Exhibit C hereto), the Examiner withdrew the rejection of corresponding claim 1 of the '725 patent. For the same reasons, withdrawal of the rejection of claims 1 and 2 of the '767 patent is appropriate and respectfully urged.

C. ***"Claims 3 to 8 are rejected under 35 U.S.C. 103 as being unpatentable over Hendrickson . . . , considered with presently cited and provided Lee and Declercq et al. . . . , but further considered with Ishitani . . . "*** **Office Action, p. 12.**

Patent Owner responded to an analogous rejection in the '725 reexamination ('725 Office Action 1/25/95 [Ex. A hereto], pp. 14-20; Amendment filed 3/24/95 [Ex. B hereto], pp. 26-29.) On pages 2-3 of the '725 Office Action mailed on May 17, 1995 (see Exhibit C hereto), the Examiner vacated all claim rejections over Hendrickson. For the same reasons here, Patent Owner respectfully submits that the rejection of claims 3-8 over Hendrickson should be withdrawn.

D. ***"Claims 3 to 8 are rejected under 35 U.S.C. 103 as being unpatentable over Lidow et al. '286 considered with Takakuwa, Okabe et al. . . . ."*** **Office Action, p. 16.** ***"Claims 1 and 2 are rejected under 35 U.S.C. 103 as being unpatentable over Lidow et al. '286 considered with Takakuwa, Okabe et al. . . . ."*** **Office Action, p. 20.**

Patent Owner respectfully submits that these rejections premised on Takakuwa as a primary reference should be withdrawn for the same reasons the Examiner has withdrawn Takakuwa as a primary reference in the '725 reexamination, as described in sections A and B, above.

IV. THE NEW REJECTION OVER OKABE IN THE '725 REEXAMINATION IS IMPROPER AND SHOULD NOT BE APPLIED IN THE REEXAMINATION OF THE '767 PATENT.

In response to the Amendment filed March 24, 1995 in Reexamination Control No. 90/003,495 ("the '725 reexamination"), the Examiner, in the Office Action mailed on May 17, 1995 in the '725 reexamination withdrew all rejections based upon the Takakuwa and Hendrickson documents as primary references. The Examiner, however, concluded that

> "Given the diminished status of the Takakuwa reference and the Hendrickson Patent as formerly plausible prior art information against the presently amended Patent Claims, we find that the Okabe et al. reference remains an applicable alternative." (5/17/95 Office Action, p. 8.)

The Examiner thus introduced new rejections of independent claims 3, 7 and 8 of the '725 patent, relying upon Okabe as a primary reference.

Patent Owner's prior discussion of the Okabe reference in the '725 reexamination was limited due to Okabe's relatively modest role in the original rejections. A Response Pursuant to 37 C.F.R. § 1.550(b) filed in the '725 reexamination concurrently herewith (a copy of which is attached as Exhibit E), expands upon the previous discussion and presents additional reasons (supported in the prior art and by the Declaration of John Shott attached thereto) demonstrating that Okabe is not relevant to the design of high power MOSFETs, the subject of the claimed '725 invention, and would not have suggested the claimed invention. Additionally, Patent Owner comes forward in that Response with additional evidence, in the form of a second Declaration of Alexander Lidow, demonstrating the nexus between the commercial success of spaced base cellular power MOSFETs and the invention claimed in the '725 patent. The Response and the accompanying Declarations are herein incorporated by reference, and are believed to obviate any potential rejections in the present reexamination based upon Okabe as a primary reference.

V. THE ADDITIONAL GATE FINGER LIMITATION OF THE '767 PATENT IS AN ADDITIONAL SIGNIFICANT DISTINGUISHING FEATURE WHICH DISTINGUISHES THE INVENTION OVER THE PRIOR ART.

As previously discussed, the '767 invention combines the cellular geometry of the '725 invention with the additional requirement of gate fingers. Since for the reasons separately set forth, the '725 invention was a unique and unobvious improvement on the prior art power MOSFET designs, the '767 invention also is unobvious over that same prior art. In addition, the '767 patent addressed an additional technical issue unaddressed by the prior art.

The Examiner stated that the Yoshida IEEE reference "use[d] a GATE pad electrode section with at least one gate electrode finger extending therefrom to electrically contact the polysilicon meshed gate electrode . . . ." (4/27/95 Office Action, p. 9.) Patent Owner sees no such statement or use in that reference. Perhaps the Examiner relied on Yoshida IEEE Fig. 3, which shows a set of lines dividing the active portion of the chip into quadrants. If the Examiner looks closely, however, he will observe that those lines are continuous with the source contact pad, not the gate contact pad.

Moreover, the Yoshida reference consistently refers to the sheet source electrode and nowhere mentions that the sheet was interrupted by fingers of gate metal. Thus, Yoshida states that

> "[T]he source and polysilicon gate multilevel electrodes are formed on the top surface. Most of the surface area can be used as a source electrode . . . . This arrangement greatly improves the current handling capability, and also minimizes source resistance." (p. 472.)

As described in the Yoshida IEEE article as well as the '725 patent, there are advantages in terms of current handling and processing to have a single sheet electrode on the top surface of a power MOSFET. In describing the performance of the resulting device, Yoshida notes that there is a "cutoff frequency" f_c that indicates the ability of the device to turn on as a function of frequency (f_c is defined as the input frequency at which the transconductance of the device is reduced by 3dB). This frequency is a function of

the gate time constant, which is the product of the input gate capacitance and the intrinsic gate resistance. (pp. 474-75.)

Like the Yoshida IEEE structure, the invention of the '767 patent employs a polysilicon gate in the form of a continuous grid over the surface of the device. Also like Yoshida, the inventors of the '767 patent recognized that it was desirable to use a sheet source electrode to improve the current-handling capability of the device. Unlike Yoshida, however, the '767 inventors also sought to reduce the inherent gate time constant, thereby improving switching performance. Yoshida, of course, teaches nothing of how this might be accomplished, and in particular says nothing about how to reduce the gate time constant without compromising current handling ability of the source electrode or disrupting the conductive channels.

Thus, Yoshida (and all other references) fail to teach or suggest, in combination with the spaced cellular base geometry, ". . . at least one finger electrically contacting said polysilicon gate at a plurality of spaced locations over the surface of said polysilicon gate electrode, thereby to reduce the R-C delay constant of said device. . . "

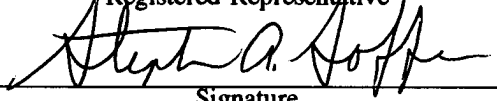
Unlike the cited references, the '767 inventors were confronted with a design that had efficiently packed channels and a desirable sheet source electrode, one or both of which must necessarily be disrupted in order to reduce the inherent gate time constant. The solution adopted by the inventors -- one or more fingerlike projections into the base array -- has proven to be an attractive compromise of the various competing design considerations. None of those considerations or tradeoffs is even addressed, much less suggested, in the prior art.

VI. CONCLUSION

For all the above reasons, it is requested that the Examiner confirm the patentability of claims 1-8 and of proposed claims 9-20 of U.S. Patent 5,130,767.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on June 27, 1995:

Stephen A. Soffen
Name of applicant, assignee or Registered Representative



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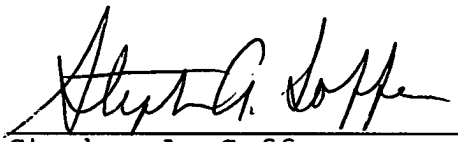
June 27, 1995
Date of Signature

Respectfully submitted,



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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing "AMENDMENT PURSUANT TO 37 C.F.R. § 1.550(b)" is being served on the attorneys for Requester SGS-Thomson Microelectronics, Inc. by sending a true copy of such document by first class mail, postage prepaid, on June 27, 1995 to the address set forth below.

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